

## PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>E36767 JFL/J</b>	<b>FOR FURTHER ACTION</b> See Form PCT/IPEA/416	
International application No. <b>PCT/NO2004/000215</b>	International filing date (day/month/year) <b>13.07.2004</b>	Priority date (day/month/year) <b>15.07.2003</b>
International Patent Classification (IPC) or national classification and IPC <b>A01K73/02</b>		
Applicant <b>Aker Seafoods Holding AS et al</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
  - a. ☒ (sent to the applicant and to the International Bureau) a total of 6 sheets, as follows:
    - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:
 

<input checked="" type="checkbox"/> Box No. I	Basis of the report
<input type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input type="checkbox"/> Box No. VIII	Certain observations on the international application

Date of submission of the demand <b>04.02.2005</b>	Date of completion of this report <b>25.10.2005</b>
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Form PCT/IPEA/409 (cover sheet) (April 2005)

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/NO2004/000215

## Box No. I Basis of the report

1. With regard to the language, this report is based on:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (Rule 12.4(a))
- ☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 3 - 7 as originally filed/furnished
- pages\* 1 - 2 received by this Authority on 19.08.2005
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- pages\* 1 - 4 received by this Authority on 19.08.2005
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- pages 1 - 5 as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/NO2004/000215

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	<u>1-12</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-12</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-12</u>	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

Documents cited in the International Search Report:

D1: US 1447553 A  
D2: US 1388414 A  
D3: DD 289919 A5  
D4: NO 166512 B  
D5: NO 313261 B1

The invention relates to a trawl apparatus with a trawl and a means for gathering seafood/biomass and conveying it to a seafood/biomass receiving vessel. The claims have been changed by the amended first to twelfth claims filed with the letter of 2005-08-19. Particularly by removing from claim 1 the features of the related cage. This still makes it unobvious to a person skilled in the art to modify the trawl net provided with a return portion in D1 in such a way that the claimed invention according to the amended first, third and fourth claim is obtained since it still is mentioned in the claims that said apparatus includes an injector (20) mounted in an upper region (16'') of a conveying hose having an upward gradient, said injector being operable to urge seafood/biomass through said hose (16 - 16'') from the trawl (1) to the vessel (3) via said upward gradient.

The cited documents represent the general state of the art and the invention defined in amended claims 1- 12 is not disclosed by any of these documents.

Accordingly, the invention defined in the amended claims 1- 12 is novel and is considered to involve an inventive step. The invention is industrially applicable.

## TRAWL APPARATUS

The present invention relates to a trawl apparatus equipped with a means for gathering seafood/biomass and conveying it to a seafood/biomass receiving vessel, as defined in  
5 more detail in the preamble of attached claims 1, 2, 3 or 4.

During a trawling operation, a trawl is towed behind a trawl vessel using adapted lines with or without otter boards, whereby seafood/biomass such as fish, shrimp and krill and/or other seafood/biomass is gathered in a trawl bag. After this trawl bag has been  
10 more or less filled with seafood/biomass, it is normally hauled on board the vessel and emptied. Alternatively, the trawl bag or sack may be emptied whilst floating alongside the vessel. Some types of seafood/biomass, such as for instance, krill, have a short lifetime after being gathered in the trawl and brought to the surface before they die and rapidly begin to decompose, their value as a raw material thus diminishing  
15 considerably. In general, it is important for all forms of seafood/biomass that it should come to the vessel undamaged and as quickly as possible for further processing, as delays in this process usually substantially diminish the quality of the seafood/biomass. Seafood/biomass that is subjected to rough handling and crushing through being gathered in a trawl bag and hauled on board the vessel, whereupon the trawl bag is  
20 emptied, or by mechanical pumping from the trawl bag for collection on board the vessel, will also be of reduced quality and value because of the damage it suffers. The reduction in value will also extend to by-products from seafood/biomass such as roe, liver or the like. Seafood/biomass that is caught in a traditional manner will also largely be dead the moment it comes aboard the vessel.

25 In connection with trawl bags, it is known to equip such a bag with a sorting grille or filtering grille to be able to separate out larger units of seafood/biomass and marine animals, as for instance larger fish. The apertures in the sorting or filtering grille will determine what marine animals or seafood/biomass are filtered out of the trawl bag.  
30 There are also prior art solutions for separating small fish from the catch using similar systems.

It has also previously been suggested to use different forms of mechanical pump solutions with an inlet opening in the end of the trawl bag so as to be able to pump the  
35 filtered content of the trawl bag directly up to a vessel on the surface, but the known solutions have not been particularly successful because of compression at the end of the trawl bag and frequent blockages.

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For further illustration of the prior art reference is made to the teachings of US Patents 1447553 and 3440752 and Norwegian Patents 109811, 35544, 166512 and 313261.

5 Accordingly, there is a substantial need to be able to enhance the efficiency with which undamaged and living seafood/biomass gathered by the trawl is conveyed to a seafood/biomass receiving vessel. The invention is of particular importance for the gathering and conveyance of krill, shrimp and other types of seafood/biomass, including all forms of fish, where conveyance to a production vessel for further processing and  
10 continuous, non-stop preservation on board can take place in controlled forms during continuous or prolonged trawling

The apparatus mentioned in the introduction is characterised by the features set forth in the characterising clause of attached claims 1, 2, 3 and 4.

15

The apparatus is advantageously used during uninterrupted, continuous or prolonged trawling, where seafood/biomass is also in an uninterrupted or continuous manner over a long period conveyed up to a receiving vessel.

20 Advantageous embodiments of the apparatus are disclosed in the dependent claims.

The invention will now be described with reference to the attached figures.

Fig. 1 is a schematic illustration of a trawling operation which makes use of a first  
25 embodiment of the apparatus according to the invention.

Figs. 2 and 3 show on an enlarged scale details of the apparatus shown in Fig. 1, according to the invention.

30 Fig. 4 shows in even further detail the collecting cage that is an integral part of the apparatus shown in Figs. 1 and 3, according to the invention. Fig. 5 is a schematic view of a trawling operation which makes use of a second, preferred embodiment of the apparatus, according to the invention.

35 Figs. 6, 7 and 8 show on an enlarged scale details of the apparatus shown in Fig. 5, according to the invention.

## Amended claims

1.

5 A trawl apparatus including a seafood/biomass gathering member, a trawl (1), and a seafood/biomass conveyor (16 - 16''), said seafood biomass conveyor being connected to transport seafood/biomass from said trawl (1) to a vessel (3), said conveyor including a hose (16 - 16''), said hose having an upper region (16''), said upper region having an upward gradient towards the surface of the sea, characterised in

10 that said apparatus includes an injector (20) mounted in said upper region (16'') of said conveyor having said upward gradient, said injector being operable to urge seafood/biomass through said hose (16 - 16'') from the trawl (1) to the vessel (3) via said upward gradient.

15 2.

A trawl apparatus according to claim 1, characterised in :

that the trawl has an elongate, rigid or flexible collecting cage (5) , said collecting cage being chosen from the set of collecting cages consisting of (a) rigid collecting cages; and (b) flexible collecting cages;

20 that said elongate collecting cage has a first portion, said first portion including an inlet opening (5') located rearward of said trawl (1) and being connected thereto; that said collecting cage (5) has a second portion, said inlet opening leading into said second portion, said second portion having openings therein, said openings being operable to strain water;

25 that said collecting cage (5) has a third portion mounted downstream of said second portion;

that a funnel (17) is connected to said downstream portion;

that a filtering grille (12) is mounted upstream of said funnel (17) to filter away seafood or biomass which is not to be led to the funnel;

30 that a conveying hose (16 16'') is connected to said funnel, said conveying hose being mounted to convey seafood/biomass to the receiving vessel (3); and

that a fluid supply hose (19) is mounted to inject fluid supplied from the vessel (3) into the conveying hose via the injector (20) to urge seafood/biomass to pass from said collecting cage (5) to the vessel.

3.

5 A trawl apparatus having a trawl (1) and a means for gathering seafood/biomass and conveying it to a seafood/biomass receiving vessel (3) , characterised in

that the trawl (1) has an elongate, rigid or flexible collecting cage (5) , said collecting cage being chosen from the set of collecting cages consisting of (a) rigid collecting cages; and (b) flexible collecting cages;

10 that said elongate collecting cage (5) has a first portion, said first portion including an inlet opening located rearward of said trawl and being connected thereto;

that said collecting cage has a second portion, said inlet opening leading into said second portion, said second portion having openings therein, said openings being operable to strain water;

15 that said collecting cage has a third portion mounted downstream of said second portion,

that a funnel (17) is connected to said downstream portion;

that a filtering grille (12) is mounted upstream of said funnel;

that a conveying hose (16 – 16'') is connected to said funnel, said conveying hose being mounted to convey seafood/biomass to the receiving vessel;

20 that a fluid supply hose (19) includes an injector (20) which is mounted to inject fluid supplied from the vessel (3) into the conveying hose, said fluid supply hose (19) being operable to urge seafood/biomass to pass from said collecting cage (5) to the vessel, and

25 that said conveying hose includes an upper area (16''), said upper area of said conveying hose (16 – 16'') having a marked upward gradient toward the surface of the sea, and said injector (20) of said fluid supply hose being mounted in said upper area of said conveying hose having said upward gradient.

4.

30 A trawl apparatus with a trawl and a means for gathering seafood/biomass and conveying it to a seafood/biomass receiving vessel, characterised in

that the trawl (1) has an elongate, collecting cage (5) which at an inlet opening is connected to the rear end region of the trawl, and from the inlet opening extends into a

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second portion, which has openings for straining water, and is terminated in a downstream portion;

that a conveying hose or pipe (16 – 16'') for conveying seafood/biomass from the collecting cage to the vessel opens into the downstream or aft portion of the cage (5) via a funnel (17);

that a filtering grille (12) is provided to filter away seafood or biomass which is not to be led to said funnel;

that air or other fluid is supplied from the vessel via a supply hose (19) to an injector (20) for injection into the conveying hose or the pipe, in order, by injector effect or fluid displacement technique, to bring the seafood/biomass from the collecting cage up to the vessel (3), and

that the supply of air or other fluid is, via the air supply hose, adapted to be injected at a point on the conveying hose or pipe by means of the injector in an upper area (16'') of the conveying hose or pipe which has a marked upward gradient towards the surface of the sea.

5.

A trawl apparatus according to claim 2, characterized in

that the injector (20) provides for injector effect or fluid displacement technique, to bring the seafood/ biomass from the collecting cage up to the vessel

6.

An apparatus according to claim 1, 2, 3, 4 or 5, characterised in

that the injector (20) is depth adjustable to be positioned at a required location in said upper area.

7.

An apparatus according to claim 2, 3 or 4, characterised in

that said sorting or filtering grille (20) is provided at the inlet opening (5') of the collecting cage (5) and is arranged to extend obliquely inwards and upwards, downwards and/or sideways in the collecting cage; and

that a portion (11) of roof, bottom and/or walls of the collecting cage (5) located at a downstream end of the grille (12) is open, so that seafood/biomass, for example, fish, or foreign objects over a certain size do not pass through the grille (12) but



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are led through the at least one open portion (11) and away from the collecting cage (5).

8.

- 5 An apparatus according to claim 2, 3 or 4, characterised in  
that the openings for straining water are formed of a self-cleaning grating or grille structure.

9.

- 10 An apparatus according to claim 2, 3 or 4, characterised in  
that at least one wall, roof or bottom portion of the collecting cage is equipped with a mechanical device for effecting the cleaning of the grating or grille structure.

10.

- 15 An apparatus according to claims 2, 3 or 4, characterised in  
that the collecting cage (5) is modularly constructed of joined sections (10).

11.

- An apparatus according to claim 2, 3 or 4, characterised in  
20 that the funnel is inside the cage (5), and  
that the mouth of the funnel faces and is spaced from the closed aft wall (9'') of the cage (5).

12.

- 25 An apparatus according to claim 2, 3 or 4, characterised in  
that in connection with, after or during the conveyance of the seafood/biomass from the collecting cage (5) to the vessel, there is provided a straining device (15') to separate seafood/biomass from seawater which accompanies it during its conveyance from the collecting cage (5) to the vessel (3); and  
30 that in connection with the straining device there is provided a deceleration device (15) which is designed to reduce the conveying rate of conveyed seafood/biomass.